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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/613,951	07/11/2000	Robert G. Wendt	TPG 306	1942

7590 12/12/2003

Kolisch Hartwell Dickinson  
McCormack & Heuser  
Suite 200  
520 S W Yamhill Street  
Portland, OR 97204

EXAMINER

PAIK, SANG YEOP

ART UNIT	PAPER NUMBER
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3742

DATE MAILED: 12/12/2003

18

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/613,951

Applicant(s)

WENDT ET AL

Examiner

Sang Y Paik

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 36-63 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36-63 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 41, 42, 43 and 62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 41 lacks proper antecedent basis for "the thermal control shield".

Claim 42 lacks proper antecedent basis for "the outer shell".

Claim 43 lacks proper antecedent basis for "the outer shell".

Claim 62 lacks proper antecedent basis for "the thermal control shield".

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 36, 38-40, 44 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baron et al (US 4,401,052) in view of Kushiya et al (US 6,092,669) or Hedstrom (US 5,445,973).

Baron et al shows a vapor deposition diffusion system for making solar cells having a substrate strip moving through a evaporation chamber with three serially located heated manifolds made of graphite or boron nitride including substantially closed vessels where each

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manifolds having an array of vapor delivery nozzles creating a fog to uniformly deposit the source material to the substrate strip. However, Baron et al does not disclose that each manifolds contains different source materials in their respective vessels.

Kushiya et al or Hedstrom shows providing three different source materials such as copper, gallium and indium for sputtering or depositing the source materials to a substrate when making solar cells. In view of Kushiya et al or Hedstrom, it would have been obvious to one of ordinary skill in the art to adapt Baron et al with each manifolds having different source materials to make solar cells that are high in light absorbing.

With respect to claim 40, Baron et al further shows a thermal shield such as a tantalum foil around the manifold. With respect to claim 54, Baron et al teaches that the deposition rate as well as uniformity of deposition depends with the geometry of the nozzle among other factors, and it would have been obvious to one of ordinary skill in the art to adapt the discharge opening of the nozzles within the claimed range or any other range that will meet the desired deposition rate and the uniformity.

5. Claims 37, 41-43, 45-53 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baron et al in view of Kushiya et al or Hedstrom as applied to claims 36, 38-40, 44 and 54 above, and further in view of Chow (US 5,031,229).

Baron et al in view of Kushiya et al or Hedstrom discloses the device claimed except having a heating system to maintain the nozzle at a temperature higher than the source material.

Chow shows an evaporating manifold or vessel made of boron nitride with a lid having a plurality of nozzle that is provided with an electrical U-shaped heating system for heating the nozzle at the temperature higher than the body of the vessel (also, see column 6, lines 6-33).

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Chow further shows the vessel/crucible having a thermal control shield having an outer shell (23) made of boron nitride with a coated protected ceramic layer (25)

In view of Chow, it would have been obvious to one of ordinary skill in the art to adapt Baron et al, as modified by Kushiya et al or Hedstrom, with the heating system to provide a higher temperature than the body of the vessel to keep the evaporated material from condensing.

With respect to claim 50, it would have been obvious to one of ordinary skill in the art to modify the distance between the nozzles within the claimed range to modify the deposition rate and the uniformity of the deposition surface.

6. Claims 56-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baron et al in view of Kushiya et al or Hedstrom and Chow as applied to claims 1-54 above, and further in view of Matsuda et al (US 5,571,749).

Baron et al in view of Kushiya et al or Hedstrom and Chow discloses the device claimed including the crucibles, the nozzles, the nozzle heating system, the thermal control shield except having a roll assembly.

Matsuda et al shows a roll assembly where a substrate strip is fed through an evaporation chamber for chemical deposition. In view of Matsuda et al, it would have been obvious to one of ordinary skill in the art to adapt Baron et al, as modified by Kushiya et al or Hedstrom and Chow, with a roll assembly to feed a strip for a continuous process of the vapor deposition.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y Paik whose telephone number is 703-308-1147. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

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The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0861.

S. P. L.

Sang Y Paik  
Primary Examiner  
Art Unit 3742

syp